Date: Wed, 29 Sep 93 04:30:13 PDT
From: Ham-Ant Mailing List and Newsgroup <ham-ant@ucsd.edu>
Errors-To: Ham-Ant-Errors@UCSD.Edu
Reply-To: Ham-Ant@UCSD.Edu
Precedence: Bulk
Subject: Ham-Ant Digest V93 #62
To: Ham-Ant

Ham-Ant Digest Wed, 29 Sep 93 Volume 93 : Issue 62

Today's Topics:

Send Replies or notes for publication to: <Ham-Ant@UCSD.Edu>
Send subscription requests to: <Ham-Ant-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Ant Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-ant".

Date: 28 Sep 1993 07:15 EDT
From: swrinde!cs.utexas.edu!math.ohio-state.edu!pacific.mps.ohio-state.edu!linac!
uchinews!cs.umd.edu!skates.gsfc.nasa.gov!nssdca.gsfc.nasa.gov!
stocker@network.ucsd.edu
Subject: Antenna Interactions
To: ham-ant@ucsd.edu

I was hoping that I might get some insight from the more experienced antenna
builders on the net. I am building a 3 element 2m Quad and an 8 element
73cm Quagi. I intend to mount them on the same mast which will be rotated
by an antenna rotator. I need to keep to one feed line to the shed so I
intend to duplex the two antennas to the single feed line. This should
ensure that the right signal gets to the right antenna.

However, I recognize that there will be some interaction between the two
antennas since they will be mounted on the same mast:

1) I haven't been able to find out what the effect of the 73cm antenna is going to have on a transmitting 2m Quad and vice versa. While I have a Yagi modeling program for my PC -- it doesn't even model this antenna interaction for Yagis. Any one have a feel? Will there be a large gain loss? Will the main or rear lobe become seriously distorted?

2) Would I be better off mounting the two antennas so the directors on the two are 180 deg opposite. This way it seems that less of the one antenna would be in main transmission path of the other.

Any input would be appreciated.

thanks,

Erich
N3OXM
stocker@spso.gsfc.nasa.gov

Date: Tue, 28 Sep 1993 17:51:46 GMT
From: dog.ee.lbl.gov!agate!howland.reston.ans.net!darwin.sura.net!udel!gvls1!rossi@network.ucsd.edu
Subject: Can wrong freq element damage Bird wattmeter or element?
To: ham-ant@ucsd.edu

Can using the wrong frequency element [slug] in a Bird wattmeter damage the element? Or the meter?

For example, if a VHF element was used on HF, sure you would expect the the power level readings not to be accurate, but as long as the meter does not go off scale, is there any danger of damaging the element?

Would the forward/reverse ratios still be me meaningful? In otherwords, could an accurate SWR reading be made even though the absolute power readings would be wrong because of the wrong frequency range element?

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Pete Rossi - WA3NNA rossi@vfl.paramax.COM

Unisys Corporation - Government Systems Group
Valley Forge Engineering Center - Paoli, Pennsylvania
==========

Date: 28 Sep 93 08:10:18 GMT
From: agate!howland.reston.ans.net!usc!cs.utexas.edu!not-for-mail@ucbvax.berkeley.edu
Subject: Feeding high-impedance antennas
To: ham-ant@ucsd.edu

I would like if somebody can elaborate on the mysteries of feeding high-impedance antennas. The examples I have in mind are the Bobtail curtain, and the bottom-fed half-wave vertical. What puzzles me the most is the following: Most of the literature references I've seen show a matching network (usually a taped LC tank), to match between the high impedance (in the range of 2K ohms) and the 50 ohm coax. It is generally said that since the impedance is high, the current into the ground is low, so even with an imperfect ground system, the losses are kept low. But, isn't a good ground system necessary anyway to ensure a low-voltage conexion to the braid-end of the coax? What kind of funny effects can develop from the fact that the coax braid end is not at low RF potential with respect to ground?

Thanks in advance for the answers,

Avi 4X6LP

Avi Plotnik
ACRI (Advanced Computer Research Institute)
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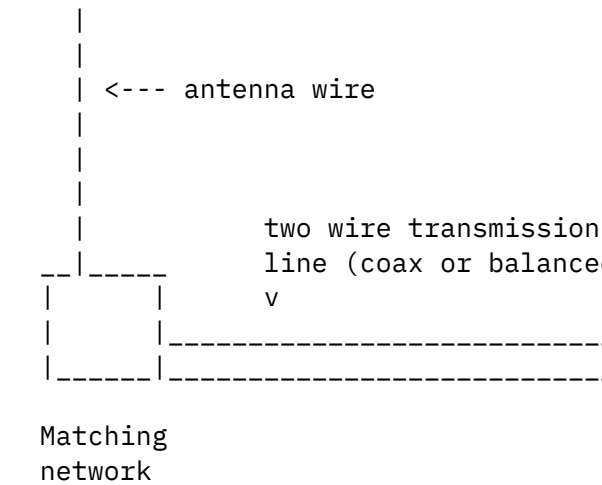
FRANCE
E-Mail: avip@acri.fr
Voice: (33) 72 35 84 20
Fax: (33) 72 35 84 10

Date: 28 Sep 93 22:57:28 GMT
From: ogicse!hp-cv!hp-pcd!hpcvsnz!tomb@network.ucsd.edu
Subject: Feeding high-impedance antennas
To: ham-ant@ucsd.edu

Avi Plotnik (avip@acri.fr) wrote:
: I would like if somebody can elaborate on the mysteries of feeding
: high-impedance antennas. The examples I have in mind are the Bobtail

Kirchhoff's current law: the net current into a node is zero.

    |



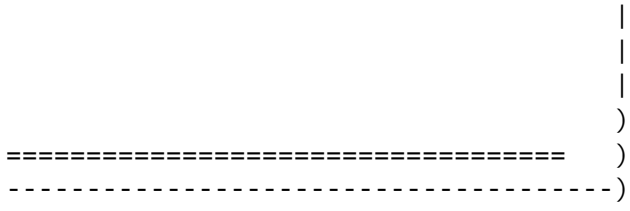
If you consider the matching network enclosure as a node (small enough compared with a wavelength that its capacitance can be ignored), then you have a transmission line current feeding the network/antenna which by definition is a balanced current: equal magnitude but opposite sign currents in the two wires. And you have an antenna current in the base of the antenna. Then Kirchhoff tells you that you must have a current equal to the antenna current, flowing out somewhere. In the case of an isolated system, it will be on the transmission line as an antenna current (see ARRL antenna books for further discussion--or await more here ;-) Since the antenna in this case is (presumed to be) high impedance, the antenna current is low relative to the transmission line current, and a ground with low to moderate impedance can conduct it away. You can encourage it to go into a reluctant ground by putting a (common-mode) choke in the transmission line. If it's really an isolated system (e.g., far above ground), you should be prepared for the effects of an antenna current on the transmission line, as it will be a part of the radiating system...

Date: Tue, 28 Sep 1993 16:50:02 GMT
From: dog.ee.lbl.gov!agate!howland.reston.ans.net!gatech!kd4nc!ke4zv!gary@network.ucsd.edu
Subject: Feeding high-impedance antennas
To: ham-ant@ucsd.edu

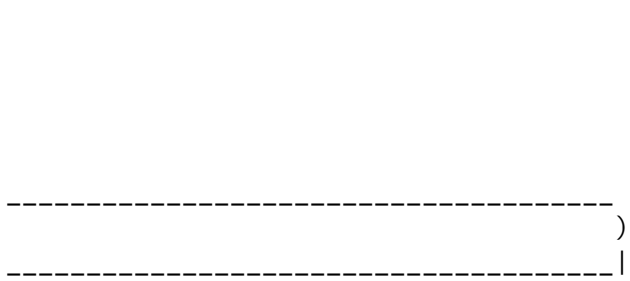
In article <9309280808.AA27150@lscc1.acri.fr> avip@acri.fr (Avi Plotnik) writes:
>I would like if somebody can elaborate on the mysteries of feeding
>high-impedance antennas. The examples I have in mind are the Bobtail

>curtain, and the bottom-fed half-wave vertical. What puzzles me the
>most is the following: Most of the literature references I've seen show
>a matching network (usually a taped LC tank), to match between the high
>impedance (in the range of 2K ohms) and the 50 ohm coax. It is
>generally said that since the impedance is high, the current into the
>ground is low, so even with an imperfect ground system, the losses are
>kept low. But, isn't a good ground system necessary anyway to ensure a
>low-voltage conexion to the braid-end of the coax? What kind of funny
>effects can develop from the fact that the coax braid end is not at low
>RF potential with respect to ground?

Let's start by drawing the circuit.



or



They're functionally the same. Remember that ideally
there's no current flowing on the *outside* of the coax,
so the coax doesn't radiate. We can treat this as a simple
autotransformer circuit. Since we have a halfwave radiator,
it doesn't require a current mirror in the ground. In fact,
assume that the antenna is 1000 meters above ground on a
balloon (like a Zepplin). The connection of the shield at
the base of the coil is the common point for the autotransformer.
It's electrically neutral. No net current flows through this point.
It's a virtual ground. (Assuming a perfect match.) So we don't
care about, or need, an actual ground connection.

If we are operating at ground level, we can ground the common
point, but it should make no difference. Now in the real world,
no match is perfect, the outside of the coax shield gets currents
induced on it, and the real ground has an end effect on the halfwave
radiator. So *some* net current can flow through the common point.
But hopefully not very much. Thus we can have a pretty poor ground

connection and still have a good antenna.

Gary
--
Gary Coffman KE4ZV | "If 10% is good enough | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | for Jesus, it's good | uunet!rsiatl!ke4zv!gary
534 Shannon Way | enough for Uncle Sam."| emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | -Ray Stevens |

Date: 28 Sep 93 22:25:50 GMT
From: ogicse!hp-cv!hp-pcd!hpspkla!depaul@network.ucsd.edu
Subject: Help with TVI from vertical antenna!
To: ham-ant@ucsd.edu

Hello there.

Most probably your twin lead is radiating like mad! You have an unbalanced rig output going into a balanced transmission line...presto...your line is now part of your radiating system. One way to FIX this is to build a balanced-balanced antenna tuner. Take 18-20' of coax, single layer wrap on an air core. This is your balun. Feed this now balanced line into a vari-L across each leg of the twin lead, with a vari-C across the antenna connection. Make darn sure that the vari-L's are near exact in their turns (to each other).

I can cause horrible everything-I, when the vari-L's aren't near exact in their matching up with each other.

Also, make sure you have good solder joints in your antenna configuration. And make sure that the twin lead doesn't touch metal along it's way to the antenna.

Otherwise, connect some 20 AWG to your neighbor's telephone line, run the legal limit, and NOW he will really have something to complain about!

With Regards,

Marc DePaul

Date: Tue, 28 Sep 1993 18:05:20 GMT
From: elroy.jpl.nasa.gov!sdd.hp.com!hp-cv!hp-pcd!hpspkla!depaul@ames.arpa
Subject: LET'S TALK SLOPERS!
To: ham-ant@ucsd.edu

Hello folks.

I want YOUR EXPERIENCES with slopers...

Let us know about whether it's a 1/4, or 1/2, or random, etc., wavelength.
Also, give us an idea of your overall sloper antenna set up, or one you
DID have up whenever.

I have a six element sloper, individually firing off with a flick of
a switch (a relay system). The length of the vertical pole is 45', and
each sloping wire is about 65-70' long. Here are my experiences thus far...

It depends on the radiation angle, but I've seen differences of up to 4
"S" units, whether it be front-back, or front to side. BUT on the same
band within a short bit there was only about 1 1/2 "S" difference between
"worst" and "best" directions. It so appears, than, that the angle
RX/TX makes a big difference.

The higher in bands I go, the more the differences. Twenty has the most
directivity, with 40 being the least. I haven't tried the other bands yet.

HAVING THE WIRES COME VERY (FOR ME WITHIN 1') CLOSE TO THE GROUND MAKES
A BIG DIFFERENCE. I had the slopers up, with their wires cut to 32.5'
(40 m) and there was barely an "S" unit difference between the "best" and
the "worst" direction. Adding more sloper wires to make them almost touch
the ground has made a huge difference. BTW, the apex angles were exactly
the same in both cases (approx. 45 degrees).

Some have written to me about slopers, but I really would like to have the
net see those and other responses. One ham saw a 40 db front to back!

Let's hear 'em...

Regards,

Marc

Date: Tue, 28 Sep 1993 16:33:43 GMT
From: usc!howland.reston.ans.net!darwin.sura.net!udel!gvls1!rossi@network.ucsd.edu
Subject: Why won't my 40 meter dipole work on 15 meters?
To: ham-ant@ucsd.edu

Once upon a time.. far far away...

Back in the late 60's when I got my novice I used a typical 'novice' antenna;
a 'plain vanilla' 40 meter dipole. Direct fed - with coax. No tuners.
No baluns. No coils. No nothing. Just two 33 foot pieces of wire,
3 insulators, and coax.

It worked just fine on 40 and 15 meters with good SWR on both bands. I forget
the exact values but, I know the SWR was 2:1 or better on both bands.

About 9 years ago when I moved, I started out all over with another simple
40 meter dipole again. But this time I also used a 1:1 balun at the feedpoint.
It worked fine on 40 meters but had very high SWR on 15 meters. I figured
that maybe the balun had something to do with the high SWR on 15 meters. I
wasn't too concerned since I didn't need it as a 15 meter antenna.

Recently the balun failed [opened?] and as a temporary fix I simply removed
it. Once again the dipole is working fine on 40 meters. It has a very
nice SWR curve. Perfect 1:1 at 7000 and rises to about 1.8:1 at 7300

Without the balun, I thought I would see if the dipole would once again work
on 15 meters. But again, the SWR is *very* high, infinite, across the entire
15 meter band. Reflected power is exactly the same as forward power everywhere
on the entire 15 meter band.

This dipole is about 25 feet off the ground, fed with RG8. The coax drops
down 90 degrees from the wire to the ground and off to the basement window.

I can understand the potential for the SWR being 'off a little' on 15 meters,
but *infinite* across the whole band? What could be so far off?

==
Pete Rossi - WA3NNA   rossi@vfl.paramax.COM

Unisys Corporation - Government Systems Group
Valley Forge Engineering Center - Paoli, Pennsylvania
==

Date: Tue, 28 Sep 1993 17:37:17 GMT
From: agate!spool.mu.edu!howland.reston.ans.net!gatech!bloom-beacon.mit.edu!
mcrcim.mcgill.edu!sifon!CC.UMontreal.CA!cumin.telecom.uqam.ca!
hobbit.ireq.hydro.qc.ca!barde!vaillan@@dog.ee.lbl.gov
Subject: Wire J-pole?
To: ham-ant@ucsd.edu

Read this one from Fred:
Clem.
--

Clement Vaillancourt,	Institut de Recherche d'Hydro-Quebec
Analyste,	Varennes, P. Quebec, Canada, J3X 1S1
Informatique scientifique	Tel:+1 514 652 8238 Fax:+1 514 652 8309
vaillan@ireq.hydro.qc.ca	Radio-amateur: VE2HQJ@VE2CRL.PQ.CAN.NA

> In article <16382@hacgate.UUCP> tony@hacgate.UUCP (Tony Reeves) writes:
> >Can someone provide me with the formula on constructing a j-pole.
> >I'm interested in the formula, not the ready made answers like
> >"make it x long for this".
> >
>
> Well, my formula is far from scientific, but if you're
> going to build one, I'll guarantee that it will work for
> VHF and above. Here's my simplified, seat-of-the-pants
> J-Pole design strategy that I've used with excellent results:
>
> First, a J-Pole is defined as a 1/2 length radiating
> element, fed by a 1/4 wavelenght parallel transmission
> line. This yields the following picture (viewed from the
> side):
>
>   --
> base -> |
>   ----------------
>
> It is related to the end-fed Zepp trailing wire antenna,
> once used on Blimps. The main idea calls for the longer
> element to be (1/2 + 1/4) 3/4 wavelength long and the
> shorter one 1/4 wavelength at the frequency of interest.
>
> The Lower part of the J forms a parallel transmission line
> which is used as a matching section for the 1/2 wavelength
> free end of the long element. In my design, the elements
> are 1/4 inch in diameter and are spaced about 2.5 inches
> apart yielding a transmission line impedance of around 400
> ohms give or take..
>
> A coax line is attached to the two sides of the parallel
> transmission line at a point above the base where a good
> match is obtained. The method and positioning of this
> attachment is one of the greatest area's of discussion and
> dissent amongst J-Pole builders.
>
> Some builders connect a coax like this:

>
> one side of coax here v
>   ----+--
> |
>   ----+-----------
> one side of coax here ^
>
> With this method, the builder will usually make a hard
> electrical connection at each point the coax attaches to
> the pole. Many designs using copper pipe for the elements
> find it handy just to solder directly to the elements.
> Most other designs will attach to a couple of screws. The
> design in the Antenna Book (ARRL), uses a sliding bar which
> can be moved up and down the J and secured with set screws
> at the matching point.
>
> There is often argument as to which part of the coax (the
> center conductor or the shield) should be attached to which
> arm of the J. In the ARRL Antenna Book, their schematic
> shows the center conductor on the short arm while the photo
> of the finished product shows the center conductor attached
> to the long arm. I always attach the center conductor to
> the long arm. I'm fairly sure, however, that it does not
> matter because what the RF sees is really something like
> this:
>
>   ============----------------------------------
>
> Which is parallel line transitioning to a single radiator.
> Whether this is true or not is irrelavent, however, since
> it's safe to say with certianty that if you conect your
> center conductor to the long arm it WILL work.
>
>
> My J-Poles use a different feed arrangement than the one
> just shown. I construct my J-Poles with a SO-239 mounted
> in the base of the J, which becomes the attachment point
> for the coax shield. I then take a 6 or 8 inch piece of
> number 12 solid insulated wire and wrap in about 4 times
> around the long element, about 4 inches up from the base.
> There is no DC connection between the feed wire and the
> element. The end of this wire is soldered into the center
> pin of the SO-239 which is sticking up from the bottom of
> the base plate.
>
>   ------0000--------------------------------
> | |
> SO-239 -> [[[-----

> |
>   -----------------
>
> This same feed arrangement is quite popular around the San
> Jose, CA area where it has been sold in large numbers by
> the American Legion at the Foothills Amateur Flea Market
> for a number of years. It is a capacitive coupling
> arrangement, despite the look that the wire is wound into a
> coil around the long radiator. It's a bit touchy to
> adjust, and the SWR is affected by bending the feed wire
> left or right between the radiators as necessary, or by
> adjusting the tightness of the coiled wire (the capacitor)
> around the radiator.
>
> At least one other design that I've seen uses a variable
> capacitor with this same arrangement, mounted in the middle
> of the feed wire which is electrically attached to both the
> SO-239 and the radiating element.
>
> Matching the antenna to the line is not terribly
> difficult. In my design, I made the base out of a flat
> piece of aluminum bar stock through which set screws were
> used to hold the elements in place. This also allowed for
> some experimental lengthening and shorting of the short
> element when tuning.
>
> In a nutshell, if you make the long element 3/4 wavelengths
> long, and make the short element 1/4 wavelength long with
> some provision for adjusting it's length, then in just a
> few minutes you'll find it very easy to locate the matching
> point for the feed wire using an SWR meter. During my
> short production run I was able to achieve a good match
> which was easily repeatable, by carefully measuring the
> feed wire and standardizing my forming method. This
> process required no further adjustment after construction,
> and did not require the use of an SWR meter.
>
> My final design resulted in a somewhat shorter than
> expected short element (17 inches instead of 19) but a
> perfect 1:1 match nonetheless. I've built about 25 of
> these antennas in both 2M and 440 versions and have heard
> nothing but satisfaction from my customers.
>
> There are two additional things which come to my attention
> on the subject. First, it ought to be possible to achieve
> a 5/8 J-Pole which would have (3dB) gain. Secondly, there
> seems to be no commercial manufacturers of J-Poles although
> the Ringo Ranger seems to be is closely related to it.

> Ham's agree that J's work well, and will almost never pay
> more than $20 for one (which seems to be a magic price).
>
> So there you have it, a non-technical description of J-Pole
> design, derived from reading, observation and practice. I
> hope you find it helpful.
>
> 73,
> | Fred Lloyd AA7BQ   Fred.Lloyd@West.sun.com |

End of Ham-Ant Digest V93 #62
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